

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

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| Applicant's or agent's file reference TS 7640 PCT | | FOR FURTHER ACTION | | See Form PCT/PEA/416 |
| International application No. PCT/EP2004/053196 | | International filing date (day/month/year) 01.12.2004 | Priority date (day/month/year) 01.12.2003 | |
| International Patent Classification (IPC) or national classification and IPC F02M27/02, F02D19/08, F02B43/10 | | | | |
| Applicant SHELL INTERNATIONALE RESEARCH MAATSCHAPPIJ B.V. | | | | |
| <p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> sent to the applicant and to the International Bureau a total of sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p> | | | | |
| <p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p> | | | | |
| Date of submission of the demand 30.09.2005 | | Date of completion of this report 11.01.2006 | | |
| Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016 | | Authorized Officer Döring, M Telephone No. +31 70 340-  | | |

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/EP2004/053196

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

Description, Pages

1-13 as originally filed

Claims, Numbers

1-14 as originally filed

Drawings, Sheets

1/2-2/2 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70:2(c)):
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/EP2004/053196

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | |
|-------------------------------|-------------|--------------|
| Novelty (N) | Yes: Claims | 5-9,12,13 |
| | No: Claims | 1-4,10,11,14 |
| Inventive step (IS) | Yes: Claims | |
| | No: Claims | 1-14 |
| Industrial applicability (IA) | Yes: Claims | 1-14 |
| | No: Claims | |

2. Citations and explanations (Rule 70.7):

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 Reference is made to the following documents (D1-D3):

D1: US 2003/168263 A1 (BOTTI JEAN JOSEPH ET AL) 11 September 2003
D2: US 2003/115857 A1 (PREIS MICHAEL ET AL) 26 June 2003
D3: EP-A-1 030 395 (DELPHI TECHNOLOGIES INC) 23 August 2000

2 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of **claims 1-4, 10, 11 and 14** is not new in the sense of Article 33(2) PCT.

2.1 The document D1 discloses (the references in parentheses applying to this document) a process for operating a compression ignition internal combustion engine (30) in combination with a catalytic partial oxidation reformer (10) (cf. Figure 1, page 3, paragraphs 31 and 32 and page 3-4, paragraph 39) and an exhaust gas aftertreater (90), wherein: a mixture of a first fuel (11) and air (63), wherein the first fuel comprises Fischer-Tropsch derived fuel (cf. page 5, paragraph 55), is introduced in the combustion chamber of the engine (30) (cf. in particular page 3, paragraph 31); exhaust gas is discharged from the engine (30); a second fuel (11) and oxygen (59) are supplied (at least during cold start) to the catalytic partial oxidation reformer (10) to produce synthesis gas (20, 21), wherein the second fuel (11) comprises Fischer-Tropsch derived fuel; at least part (20) of the synthesis gas (20, 21) is supplied the exhaust gas aftertreater (90) and another part (21) to the combustion chamber of the engine (30); or to both.

2.2 The subject-matter of the **independent claim 1** is therefore not new (Article 33(2) PCT).

2.3 Furthermore, document D3 also (cf. in particular Figure 1 and column 5, paragraph 21) discloses the subject-matter of the **independent claim 1** (Article 33(2) PCT).

- 2.4 **Dependent claims 2-4, 10, 11 and 14** do not appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT with respect to novelty because the subject-matter of **claims 2-4, 10 and 14** is already disclosed by the document D1. Moreover, an exhaust gas recirculation system according to **claim 11** is known from the document D3.
- 3 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of **dependent claims 5-9, 12 and 13** does not involve an inventive step in the sense of Article 33(3) PCT.
- 3.1 The supply of synthesis gas to NOx abatement systems for regeneration purposes as described in the **dependent claims 5-9** is already known from the document D2. In order to improve the regeneration process, the person skilled in the art would combine the teaching of the two documents D1 and D2 without the exercise of inventive skill, in order to solve the problem posed.
- 3.2 The volumetric ratios noted in **claims 12 and 13** fall in a merely straightforward chosen range which the skilled person would select, in accordance with circumstances, without the exercise of inventive skill.